Illinois Environmental
Protection Agency

5415 N. University
Peoria, Ill. 61614

September 26, 1989

ROCK ISLAND COUNTY
(East Moline)

-John Deere Harvester Works
Wastewater Treatment Facilities
Inspection Report

Mr. Robert G. Dick
Environmental Coordinator
John Deere Harvester Works
1100 13th Avenue
East Moline, Illinois 61244

Dear Mr. Dick:

On September 13, 1989, the undersigned, accompanied by Dean Piatt of the City of East Moline, conducted an inspection of your wastewater discharges and treatment facilities. You were contacted during this visit. The purpose of this letter is to confirm and augment verbal comments made during this inspection, as follows:

1. An Agency construction permit needs to be obtained for the proposed direct discharge of cleaning line rinse and wash waters to the E. Moline POTW. This proposed change constitutes a modification of a wastewater source and requires a construction permit. Operating permits for wastewater pretreatment works are obtained from the City of E. Moline as they have EPA delegation for administering their pretreatment program.

2. The wastewater pretreatment facility effluent will need to be monitored by 24-hour composite sample at least one-four consecutive day period, on a semi-annual basis, per the categorical metalfinishing standards.

3. Cyanide samples should be checked for chlorine and dechlorinated as needed at the time of collection prior to shipment to the commercial lab.

4. In order to provide for the most accurate possible flow readings at outfall 001 the installation of a sharp-crested weir is recommended. Also, the depth of flow measuring point should be established a certain distance upstream of the weir which is at least four times the depth of water over the weir.

5. Plans should be made for routine cleaning of the sedimentation pond to improve performance. It is possible some contaminated sludge may be present due to process wastewaters entering the pond prior to start-up of your wastewater pretreatment facility.

6. Storm sewer discharges presently not tributary to the sedimentation pond should be evaluated to determine if sufficient contamination is present to warrant treatment such as diversion to the pond. In addition, NPDES Permit applications are due to be filed by February 4, 1990 for industrial storm sewer discharges per the Clean Water Act.

7. Transformers containing PCB compounds should be decontaminated. We understand all PCB capacitors have been replaced.

8. The action you are presently taking to replace your underground storage tank farm is appreciated. As you know, any contaminated soil found during removal of your underground tanks will need to be disposed of per Pollution Control Board Regulations. It is anticipated some contamination may be found as a result of the 1983 hydraulic oil leak.

Should you have any questions or comments regarding this letter, please feel free to contact me.

Very truly yours,

James E. Kammueller

James E. Kammueller, Manager
Peoria Office, Region 3
Div. of Water Pollution Control

JEK/lb

cc:-City of E. Moline
-Dean Piatt

bcc:-DWPC/FOS & RU
-DWPC/Permit Section-Ind. Unit
-Peoria Files

MEMORANDUM

SUBJECT: ROCK ISLAND COUNTY -John Deere Harvester Works
(E. Moline) IU Inspection and Compliance Survey
IL0003018

TO: DWPC/FOS & RU

FROM: James E. Kammueller, DWPC-FOS, Region 3

DATE: September 13, 1989

On the above date the writer, accompanied by Dean Piatt of the City of E. Moline POTW staff, conducted subject inspection. Deere Environmental Coordinator Robert Dick was interviewed (phone 309/765-6272). The purpose of the visit was to conduct the subject inspections and also discuss Deere's proposal to discharge wash line wastewater from one washer system and 3 rinse tanks direct to the POTW rather than first treating it through their wastewater pretreatment facility (WWPTF).

This industry produces combines and combine cutting heads. They employ beween 2,000 and 2,500 people which is down from a high of about 5,000 a few years ago. The plant works 2 shifts/day, 5 days/week. Raw metal products go through a variety of machining and fabrication processes and are ultimately assembled into the combines and heads. Non-cyanide bath heat treating is also performed. Process wastewaters treated in the WWPTF total about 200,000 gpd. Approximately 90% (180,000 gals) comes from 3 pre-paint cleaning lines known as lines #970, 972, and 974. One (1) percent comes from 7 water curtain paint booths and about 9% comes from miscellaneous washing operations including truck, floor and parts washing using water soluble cleaners. Some machine coolants may also be present but most of these are recycled. Miscellaneous process wastewaters include water treatment demineralizer wastes and sludge, boiler blow-down, condensate, floor drains, sanitary wastes, etc., which are discharged direct to the E. Moline POTW. These total about 173,000 gpd. NPDES discharges consist of powerhouse condenser cooling water (river water), miscellaneous small city water cooling water streams (heat treat heat exchangers, air compressors, air conditioners, etc.) and the majority of the plant storm water drainage including coal pile run-off. These NPDES discharges are treated in a sedimentation/flotation pond system prior to discharge to the Mississippi River via outfall 001 as described later in this report. There are also two storm sewer discharges direct to the river not presently covered by a NPDES permit. A flow diagram is attached which has been updated somewhat but a new diagram is probably needed.

The company generates its electrical power and also buys it from Iowa-Illinois. They also produce their own steam for use in heating and much of their steam-driven equipment. They burn Illinois coal and have a precipitator on their powerhouse stack.

Within the past 1-1/2 years a $10,000,000 paint system expansion went on line in order to improve paint quality, avoid the need for primer paint and meet APC VOC emission requirements. These improvements consisted of 3 new wash lines and 2 new electro-coat paint lines. Water-based paints are now used to paint all products with only certain external parts of the combine cab receiving a second coat of a 2-part epoxy-urethane solvent base final coat for additional corrosion protection.

Following cleaning on one of two identical wash lines known as line 972 and 974, all parts receive the electro-coat paint using a dip bath process. Smaller parts pass through the bath and larger parts are dipped via a hoist ("indexed"). There are also the 7 water curtain spray booths. The combine is then assembled and goes to wash line 970 where it is washed and rinsed before the solvent-based paint is applied to selected body areas.

The wash lines 972 and 974 generate wastewater containing the most contamination as they clean the raw steel after it has been machined and fabricated. The 970 line cleans the final assembled combine and generates mostly wastewater containing cleaner (concentrated non-alkaline soap), dust, smaller amounts of dirt and oil and sanding debris (if any parts of the cab have been sanded prior to the final epoxy paint coat). The epoxy paint reportedly accounts for under 50% of the paint volume used by Deere.

Sludges from the washing lines and paint booths are taken to the Peoria City/County Landfill.

The identical wash lines 972 and 974 consist of the following flow pattern:

Tank #	Process
1.	Alkaline wash
2.	City water rinse
3.	Iron phosphate wash
4.	City water rinse
5.	Chromic acid rinse
6.	City water rinse
7.	Deionized (DI) water rinse

The DI water from tank #7 is recycled to tank #6 and Deere proposes to discharge rinse water from tank 4 on both the 972 and 974 wash lines direct to the POTW to reduce flows to the WWPTF.

The 970 wash line consists of washing and rinsing of the assembled combine and Deere proposes to discharge both of these streams untreated to the POTW.

Deere feels all the above 4 streams do not require treatment and are of better quality than the WWPTF effluent. Mr. Piatt is concerned about possibly having 4 additional sampling points to monitor. I advised an Agency permit should be issued for these changes if the City was willing to accept this wastewater. There are two sanitary sewers leaving Deere property and connecting to the POTW interceptor. These are the north and south sewers. The north sewer presently carries mostly sanitary wastewater but would also receive these 4 new discharges if they are allowed. The south sewer presently receives sanitary, WWPTF effluent and other process wastewaters mentioned previously.

The paint pigments do contain lead, chrome and a small amount of cyanide per Mr. Dick. Lead is the main contaminant of concern in the WWPTF.

Until 1-1/2 years ago Deere used all solvent-based paint and spray and dip painting booths/lines. Until the WWPTF went on line in 1977, under Permit 1976-EB-1387-C, all wash line and paint line process wastewaters were discharged to an old sedimentation pond which was built in 1956. This old pond was abandoned and a new pond was built late 1975-early 1976 under Permits 1975-EB-1235 COP due to COE flood control work. Prior to the new pond, all process wastewater went to the old pond and then to the Mississippi River. There was no treatment prior to 1956. Old file information relates to concerns regarding metals, detergent foaming, cyanide, etc., in this discharge. On July 11, 1977, the new WWPTF went on line and all process wastewaters were removed from outfall 001.

The WWPTF consist of 3 raw influent holding tanks, a 220,000-gallon batch treatment tank, an influent holding tank for wastes from other Deere plants, a vacuum filter and related chemical storage, feed and piping facilities. Two (2) holding tanks have capacities of 30,000 gallons each and one has a 60,000-gallon capacity. All raw wastewater is pumped to the plant and normally enters the 60,000-gallon tank first. The holding tanks are allowed to fill while batch treatment is occurring and the batch treatment tank is being drained to the POTW. The plant treats about 200,000 gpd of flow 5 days/week from the Harvester plant and also off-site paint line wastestreams from the Deere Foundry (150 gpd) and 15,000 gpd from the Deere Davenport Works plant, which are trucked in. Flows from the Harvester plant have increased due to the new paint line which went into use last year as described above. The wastewater holding and batch treatment tanks are located outdoors and the chemical storage and feed equipment and vacuum filter are located indoors. The chemical storage tanks are diked. The batch tank has 2 overflow pipes--one is fixed elevation and the other is a swing pipe. Mixing in the batch tank occurs via a row of compressed air diffusers along one side of the tank. Discharges to the POTW are observed for presence of sludge. WWPTF DMF is 220,000 gpd, so the plant is at capacity and Deere would like to off-load the above mentioned rinse/wash water streams.

Each batch of raw wastewater is bench tested under at least 3 different chemical feed dosages to determine how much chemical to feed to the batch tank. Supernatant from the bench tests is analyzed for chrome and lead to determine the most effective chemical dosage. Deere uses lead removal as the standard for good effluent quality. They have found that if lead is removed, then so are the rest of the metals they treat for. Lead is felt to precipitate best at pH 9. The basic treatment process is to reduce chrome then precipitate metals, all in the batch tank, as follows:

Add Sulfuric Acid to pH 2.5
Add Sodium Metabisulfite for Cr^{+6} reduction
Verify Cr^{+6} reduction with wet chemistry
Add Ferric Chloride
Add Sodium Hydroxide to pH 9
Add Cation Polymer
Add Anion Polymer
Allow to settle
Discharge to sanitary sewer
Collect sample during discharge (grab for categorical parameters)
Dewater sludge - vacuum filter
Analyze samples and record data

Deere effluent data indicates compliance with categorical and local limits. A copy of their most recent semi-annual report is attached. Deere performs their own testing (metals, pH) with the exception of CN and TTO which are sent to Daily Labs in Peoria and FOG which is sent to the Quad City Water Treatment Lab. The POTW requires end of process compliance for local limits but allows self-monitoring for compliance at the "South" manhole which is end of pipe. The POTW IU permits are written to allow the permittee to request end of pipe compliance for local limits. Deere performs quarterly self-monitoring at the north and south end of pipe manholes per the IU permit. Self-monitoring at the south manhole is performed when the WWPTF is discharging and the WWPTF effluent is also monitored daily when discharging via a grab sample.

Reportedly, it takes 3-4 hours to treat a batch of wastewater and another 5-6 hours to discharge it. The batch tank contains two parallel flight sludge collectors which move sludge to a hopper at the end of the tank from where it is pumped directly to the vacuum filter. One (1) to two (2) 15 yd^3 dumpsters per week of orange-colored sludge are generated and taken as a special waste to the Upper Rock Island County Landfill. The sludge reportedly is non-hazardous based on EP-toxicity.

Sludge is not always filtered after each batch and is left in the batch tank to then be "doubled up" with the next batch of sludge. Sludge is not allowed to build up beyond 1' deep in the batch tank. The batch tank fixed overflow pipe is 42" above the

tank bottom. There is also the swing overflow pipe which can remove water closer to the tank bottom but water must reportedly be pumped to this pipe.

At the time of this inspection a batch had been treated and discharged to the POTW. The batch tank contained about 2-1/2' of water with no sludge blanket noted. Sludge had not yet been filtered. Wastewater was being pumped into the 60,000-gallon holding tank.

Inspection of the sedimentation/flotation pond indicated it was receiving a flow of condensor cooling water from the power house which had a muddy-brown color typical of river water. Due to lack of hydraulic gradient through the pond, the 72" influent pipe was flowing about 1/2 full. Cooling water flow ranges from 3 MGD to 8 MGD depending upon the season. The oil belt skimmer was not in use but is operated as needed. The pond effluent was typical in appearance of river water and is discharged to the Mississippi River via 2 submerged 24" outfall lines. The condensor cooling water contains no Cl_2 or other additives.

A sketch of the pond is attached. It has a surface area of about 21,000 ft^2 and a volume of around 84,000 ft^3 (4' depth) as designed. The average depth is now estimated at 1'-2' due to sedimentation and some bank erosion. A bypass channel (part of the old 1956 pond) is provided for cleaning but the pond has never been cleaned. An underflow dam and belt oil skimmer are located about half way between the pond inlet baffle and outlet structure which is a broad-crested concrete dam. Oil skimmings enter an adjacent UST. A sonic level sensor is provided directly above this dam. However, the depth over this dam is shallow due to the long length of the dam and accuracy of flow measurements are somewhat questionable. A sharp-crested weir and/or possibly a narrower outlet were suggested.

The pond receives essentially all river water plus the majority of the plant storm water. Some small miscellaneous potable water streams, as previously described on page one, are also present. A portion of the river intake water is treated (lime softened and filtered) and used as boiler feed water which is then lost by evaporation and blown-down to the POTW. Therefore, river intake volume is a little greater than discharge volume. Water treatment wastes go to the POTW direct as previously mentioned.

It was noted the company was replacing their UST farm with an above ground farm under construction. Storage tanks include diesel fuel, lubricants, hydraulic oil and antifreeze. When removing the underground UST farm they expect to find more hydraulic oil from their 1983 leak (see my 3-1-83 memo). Any contaminated soil will be properly disposed of per Mr. Dick. The UST serving the sedimentation pond will be placed in a vault.

Miscellaneous wastes or waste streams include quench water which is reportedly a bath of water used to dip (cool) hot tongs which are used to handle hot parts from a few remaining forge presses. Mr. Dick wasn't sure where this water was discharged to but said it might contain low levels of iron. Methylene chlorine is present in paint stripper used by Deere to manually clean and repair bad paint on the combines but it isn't discharged according to Mr. Dick who reported all solvent wastes are taken to reclaimers or fuel blenders.

Inspection Summary

1. An Agency permit needs to be obtained for the proposed direct discharge of cleaning line rinse and wash waters to the E. Moline POTW. This proposed change constitutes a modification of a wastewater source and requires a construction permit. Operating permits for wastewater pretreatment works are obtained from the City of E. Moline as they have delegation for administering their pretreatment program.

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5. Plans should be made for routine cleaning of the sedimentation pond to improve performance. Some old contaminated sludge may be present prior to start-up of the WWPTF.

6. Storm sewer discharges presently not tributary to the sedimentation pond should be evaluated to determine if sufficient contamination is present to warrant diversion to the pond. In addition, NPDES Permit applications are due to be filed by February 4, 1990 for industrial storm sewer discharges per the Clean Water Act.

7. Transformers containing PCB compounds should be decontaminated. All PCB capacitors have reportedly been replaced.

The above is to document this inspection.

James E. Kammueller

JEK/lb

Att:-Semi-annual Report (first half of 1989)
-USGS Map
-Flow schematics for plant site and WWPTF
-Plant/pond schematic

cc:-Peoria Files

RL JER

JOHN DEERE HARVESTER WORKS

1100 13TH AVENUE, EAST MOLINE, ILLINOIS 61244-1497 U.S.A.

27 June 1989

U.S. Environmental Protection Agency
Region 5, 5WQP-11
230 South Dearborn Street
Chicago, IL 60604

METAL FINISHING PRETREATMENT STANDARDS

COMPLIANCE REPORT

USER I.D. NUMBER 33IL0028550 002

This report is being submitted in accordance with 40CFR 403.12(d). The attached Exhibit A shows the results of batch treatments from 9 December 1988 through 14 June 1989. These analyses show that the standards are being met on a consistent basis.

All samples for which test results have been reported herein were analyzed according to methods outlined in the regulations.

R. G. Kleine
General Manager

R. G. Dick
Environmental Coordinator

c: City of East Moline
Illinois EPA - DWPC
M. E. McGuire - Deere & Company

890623RGD/01A/jgp2

JOHN DEERE HARVESTER WORKS/EAST MOLINE
EXHIBIT A
PRETREATMENT EFFLUENT CONCENTRATION (mg/l)

DATE	GALLONS TREATED	Cr	Pb	Ni	Zn	Cd	Cu	Ag	TOTAL METALS	CN(T)	ACID FRACTION COMPOUNDS TOTAL
09 Dec 1988	141,130	0.06	0.07	0.04	0.08	<0.01	0.08	0.01	0.26		
13 Dec 1988	214,261	0.05	0.04	0.04	0.08	0.01	0.11	0.01	0.27	0.01	.038
14 Dec 1988	214,261	0.07	0.13	0.05	0.07	0.01	0.07	0.01	0.26		
16 Dec 1988	214,261	0.05	0.16	0.05	0.06	0.01	0.08	<0.01	0.24		
17 Dec 1988	214,261	0.05	0.08	0.04	0.06	0.01	0.08	<0.01	0.23		
21 Dec 1988	214,261	0.07	0.07	0.09	0.08	0.02	0.10	0.01	0.34		
22 Dec 1988	187,318	0.05	0.07	0.07	0.08	0.01	0.09	0.01	0.29	<0.01	
29 Dec 1988	192,450	0.05	0.02	0.05	0.10	0.01	0.07	<0.01	0.27		
04 Jan 1989	214,261	0.04	0.03	0.11	0.10	0.02	0.08	0.01	0.33		
06 Jan 1989	214,261	0.04	0.04	0.09	0.06	0.01	0.09	<0.01	0.28		
09 Jan 1989	195,016	0.01	0.03	0.16	0.06	0.01	0.10	0.01	0.33		
11 Jan 1989	214,261	0.05	0.07	0.12	0.05	0.01	0.10	0.01	0.32	0.01	.915
12 Jan 1989	214,261	0.03	0.04	0.13	0.06	0.01	0.10	0.01	0.32		
13 Jan 1989	164,224	0.05	0.04	0.11	0.05	0.01	0.10	<0.01	0.31		
17 Jan 1989	214,261	0.06	0.09	0.09	0.07	0.01	0.08	0.01	0.30		
18 Jan 1989	206,563	0.12	0.17	0.09	0.12	0.03	0.11	0.01	0.44		
20 Jan 1989	215,544	0.16	0.16	0.12	0.11	0.02	0.08	0.01	0.47		
23 Jan 1989	214,261	0.04	0.06	0.08	0.07	0.01	0.06	0.01	0.25		
24 Jan 1989	214,261	0.09	0.06	0.09	0.11	0.03	0.12	0.01	0.43		
26 Jan 1989	214,261	0.06	0.10	0.10	0.06	0.02	0.04	0.01	0.26		
27 Jan 1989	214,261	0.06	0.08	0.18	0.06	0.03	0.06	0.01	0.36		
30 Jan 1989	214,261	0.08	0.03	0.08	0.03	0.01	0.04	0.01	0.23		
31 Jan 1989	212,978	0.07	0.10	0.08	0.05	0.01	0.06	0.01	0.26		
02 Feb 1989	214,261	0.04	0.09	0.10	0.06	0.01	0.08	0.01	0.28	<0.01	.093
03 Feb 1989	207,846	0.08	0.06	0.06	0.06	0.01	0.06	0.01	0.26		
06 Feb 1989	214,261	0.08	0.08	0.05	0.05	0.01	0.08	0.01	0.26		
08 Feb 1989	214,261	0.06	0.05	0.08	0.06	0.01	0.07	0.01	0.27		
09 Feb 1989	193,733	0.11	0.04	0.08	0.05	<0.01	0.07	0.01	0.31		
11 Feb 1989	215,544	0.16	0.09	0.08	0.05	0.01	0.11	0.01	0.40		
14 Feb 1989	214,261	0.03	0.02	0.08	0.05	0.01	0.05	0.01	0.21		
16 Feb 1989	214,261	0.29	0.09	0.06	0.08	0.01	0.10	0.02	0.53		
17 Feb 1989	211,261	0.07	0.03	0.07	0.05	<0.01	0.10	0.01	0.29		
18 Feb 1989	173,205	0.15	0.09	0.06	0.07	0.01	0.09	0.01	0.37		
20 Feb 1989	207,846	0.09	0.05	0.09	0.06	0.04	0.07	0.01	0.31		
22 Feb 1989	214,261	0.05	0.06	0.07	0.07	0.01	0.09	0.01	0.28		
24 Feb 1989	214,261	0.03	0.05	0.07	0.05	0.01	0.06	0.01	0.21		
25 Feb 1989	187,318	0.04	0.03	0.08	0.06	0.01	0.05	0.01	0.23		
28 Feb 1989	214,261	0.05	0.02	0.14	0.06	<0.01	0.05	0.01	0.30		
01 Mar 1989	187,318	0.04	0.03	0.08	0.04	0.01	0.06	0.01	0.22		
03 Mar 1989	214,261	0.03	0.02	0.03	0.02	0.01	0.04	0.01	0.12		
06 Mar 1989	214,261	0.06	0.06	0.08	0.05	0.01	0.09	0.01	0.27		
07 Mar 1989	214,261	0.06	0.03	0.10	0.07	0.01	0.11	0.01	0.34	<0.01	.180
08 Mar 1989	214,261	0.06	0.04	0.08	0.05	0.01	0.10	0.01	0.29		
10 Mar 1989	214,261	0.04	0.03	0.06	0.05	0.01	0.04	0.01	0.19		
11 Mar 1989	211,695	0.22	0.11	0.04	0.08	0.01	0.03	0.01	0.37		
13 Mar 1989	209,129	0.05	0.08	0.11	0.06	0.01	0.09	0.01	0.31		
15 Mar 1989	214,261	0.04	0.07	0.08	0.07	0.01	0.05	0.01	0.24		

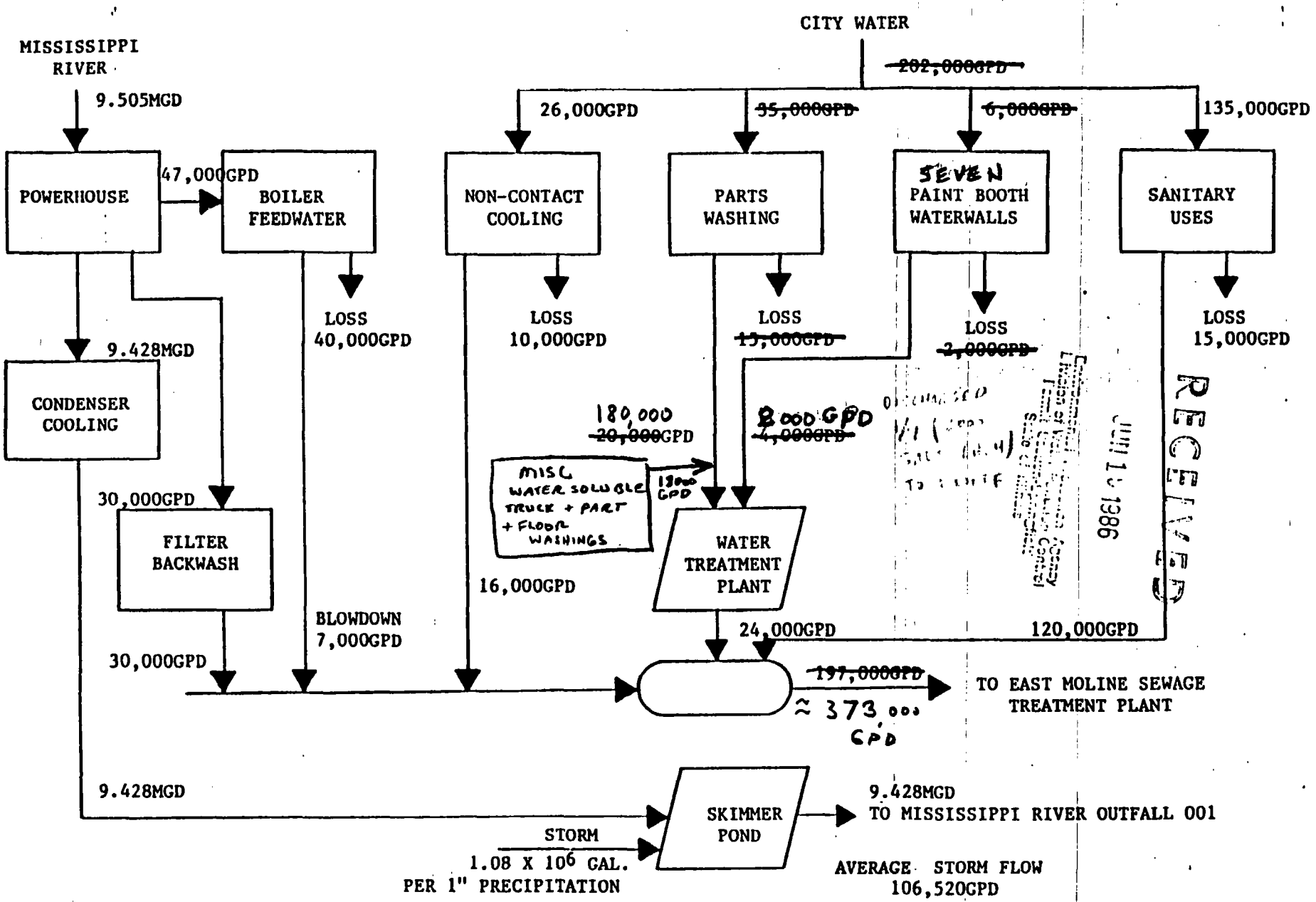
DATE	GALLONS TREATED	Cr	Pb	Ni	Zn	Cd	Cu	Ag	TOTAL METALS	CN(T)	ACID FRACTION COMPOUNDS TOTAL
16 Mar 1989	214,261	0.05	0.05	0.06	0.06	0.01	0.04	0.01	0.21		
18 Mar 1989	196,299	0.03	0.06	0.12	0.05	0.01	0.06	0.01	0.26		
20 Mar 1989	214,261	0.12	0.06	0.05	0.07	0.01	0.12	0.01	0.36		
22 Mar 1989	170,639	0.05	0.06	0.06	0.04	0.01	0.06	0.01	0.21		
23 Mar 1989	150,111	0.14	0.12	0.06	0.08	0.01	0.04	0.01	0.32		
27 Mar 1989	214,261	0.03	0.07	0.10	0.06	0.01	0.03	0.01	0.22		
29 Mar 1989	214,261	0.01	0.05	0.06	0.05	<0.01	0.02	0.01	0.14		
30 Mar 1989	186,035	0.05	0.07	0.08	0.08	0.01	0.06	0.01	0.27		
31 Mar 1989	184,752	0.15	0.14	0.08	0.10	0.01	0.03	0.01	0.36		
03 Apr 1989	215,544	0.16	0.11	0.10	0.06	0.01	0.03	<0.01	0.35	<0.01	.261
04 Apr 1989	215,544	0.07	0.06	0.13	0.06	0.01	0.10	<0.01	0.36		
06 Apr 1989	215,544	0.25	0.14	0.12	0.09	0.01	0.10	<0.01	0.56		
07 Apr 1989	215,544	0.32	0.17	0.13	0.13	0.01	0.14	0.01	0.72		
08 Apr 1989	209,280	0.12	0.09	0.10	0.07	0.01	0.04	0.01	0.33		
11 Apr 1989	214,261	0.07	0.17	0.16	0.06	0.02	0.08	0.02	0.37		
12 Apr 1989	215,544	0.06	0.09	0.13	0.04	0.01	0.03	0.01	0.26		
13 Apr 1989	215,544	0.80	0.66	0.07	1.26	0.01	0.12	0.01	2.25		
14 Apr 1989	214,261	0.04	0.15	0.14	0.11	0.01	0.08	0.02	0.47		
15 Apr 1989	184,752	0.03	0.10	0.09	0.05	0.01	0.06	0.01	0.23		
18 Apr 1989	214,261	0.10	0.12	0.10	0.10	0.01	0.05	0.01	0.35		
20 Apr 1989	214,261	0.07	0.06	0.06	0.05	0.01	0.07	0.01	0.25		
21 Apr 1989	214,261	0.45	0.18	0.08	0.08	0.01	0.09	0.02	0.70		
22 Apr 1989	183,469	0.07	0.07	0.08	0.14	0.01	0.06	0.01	0.35		
24 Apr 1989	214,261	0.04	0.06	0.13	0.03	0.01	0.06	0.02	0.26		
26 Apr 1989	214,261	0.14	0.08	0.13	0.37	0.02	0.16	0.01	0.80		
27 Apr 1989	214,261	0.03	0.03	0.08	0.23	0.01	0.07	0.01	0.41		
28 Apr 1989	214,261	0.05	0.08	0.08	0.10	0.02	0.04	0.01	0.27		
29 Apr 1989	139,847	0.08	0.05	0.08	0.13	0.01	0.03	0.01	0.32		
02 May 1989	214,261	0.04	0.03	0.07	0.06	<0.01	0.02	0.01	0.19		
03 May 1989	214,261	0.06	0.06	0.09	0.02	0.01	0.05	0.01	0.22		
04 May 1989	214,261	0.04	0.07	0.09	0.03	0.01	0.04	0.01	0.20		
05 May 1989	193,733	0.02	0.06	0.13	0.08	0.02	0.05	0.02	0.28		
06 May 1989	161,658	0.03	0.06	0.11	0.05	0.01	0.04	0.02	0.23		
09 May 1989	214,261	0.03	0.06	0.09	0.10	0.02	0.03	0.02	0.25		
10 May 1989	214,261	0.03	0.02	0.08	0.04	<0.01	0.02	0.01	0.17		
11 May 1989	206,563	0.04	0.09	0.06	0.06	0.01	0.06	0.01	0.22		
12 May 1989	203,997	0.12	0.10	0.05	0.06	0.01	0.02	0.01	0.25		
15 May 1989	214,261	0.03	0.09	0.06	0.05	0.01	0.03	0.01	0.17	<0.01	.114*
16 May 1989	214,261	0.02	0.10	0.11	0.07	0.02	0.04	0.02	0.24		
17 May 1989	214,261	0.05	0.02	0.07	0.08	0.01	0.04	0.02	0.24		
18 May 1989	214,261	0.02	0.04	0.08	0.05	<0.01	0.03	0.01	0.18		
19 May 1989	214,261	0.12	0.14	0.08	0.12	0.01	0.04	0.01	0.36		
22 May 1989	214,261	0.04	0.07	0.05	0.07	0.01	0.04	0.01	0.20		
22 May 1989	214,261	0.05	0.14	0.16	0.06	0.01	0.03	0.02	0.30		
23 May 1989	211,695	0.03	0.08	0.05	0.07	<0.01	0.02	0.01	0.17		
24 May 1989	203,997	0.03	0.05	0.08	0.08	0.01	0.03	0.01	0.22		
25 May 1989	192,450	0.02	0.06	0.06	0.10	0.02	0.04	0.02	0.22		
26 May 1989	169,356	0.07	0.07	0.09	0.12	0.01	0.05	0.02	0.33		
27 May 1989	139,847	0.04	0.04	0.14	0.08	0.01	0.03	0.02	0.29		
30 May 1989	214,261	0.03	0.04	0.07	0.08	0.01	0.05	0.01	0.23		
31 May 1989	214,261	0.02	0.04	0.20	0.09	0.01	0.04	0.01	0.35		

DATE	GALLONS TREATED	Cr	Pb	Ni	Zn	Cd	Cu	Ag	TOTAL METALS	CN(T)	ACID FRACTION COMPOUNDS TOTAL
01 Jun 1989	151,394	0.02	0.09	0.10	0.11	0.01	0.05	0.01	0.28		
02 Jun 1989	170,639	0.04	0.14	0.10	0.13	0.02	0.05	0.02	0.32		
03 Jun 1989	129,583	0.03	0.10	0.09	0.13	0.02	0.05	0.02	0.30		
06 Jun 1989	207,846	0.03	0.04	0.07	0.05	0.01	0.02	0.02	0.17		
07 Jun 1989	196,299	0.04	0.09	0.15	0.22	0.01	0.07	0.01	0.48		
08 Jun 1989	183,469	0.02	0.04	0.10	0.10	<0.01	0.04	0.01	0.26		
09 Jun 1989	187,318	0.02	0.04	0.09	0.13	0.01	0.04	0.01	0.38		
12 Jun 1989	214,261	0.06	0.04	0.12	0.12	<0.01	0.04	0.01	0.34		
13 Jun 1989	180,903	0.03	0.05	0.14	0.10	0.01	0.03	0.01	0.30		
14 Jun 1989	156,526	0.02	0.03	0.12	0.11	0.01	0.03	0.01	0.28		

22,091,937 GALLONS (117,510 GALLONS PER DAY)

*INCLUDES BASE NEUTRAL, ACID FRACTION AND VOLATILE COMPOUNDS

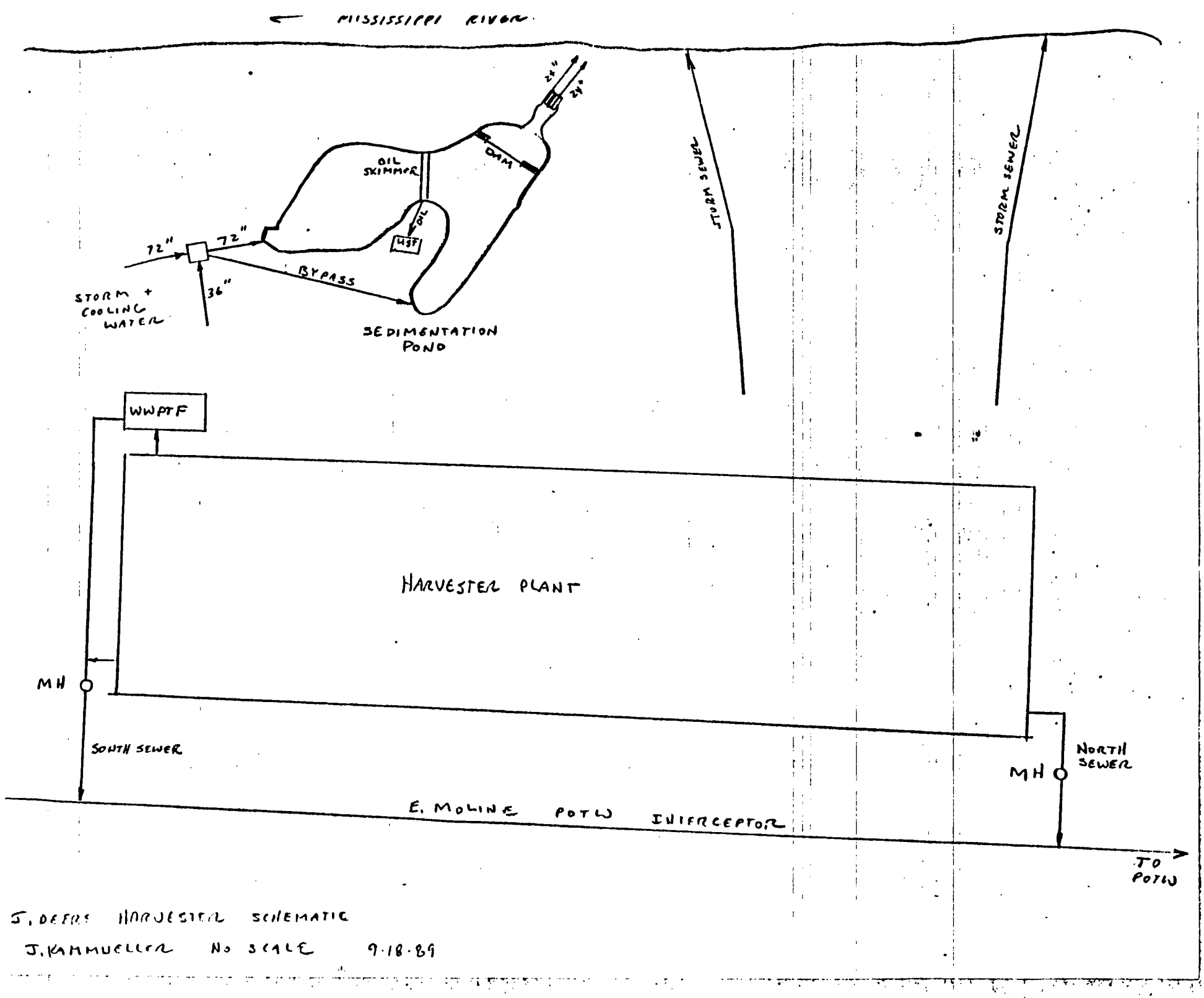
890623RGD/01/jgp2



MGD = MILLION GALLONS PER DAY
GPD = GALLONS PER DAY

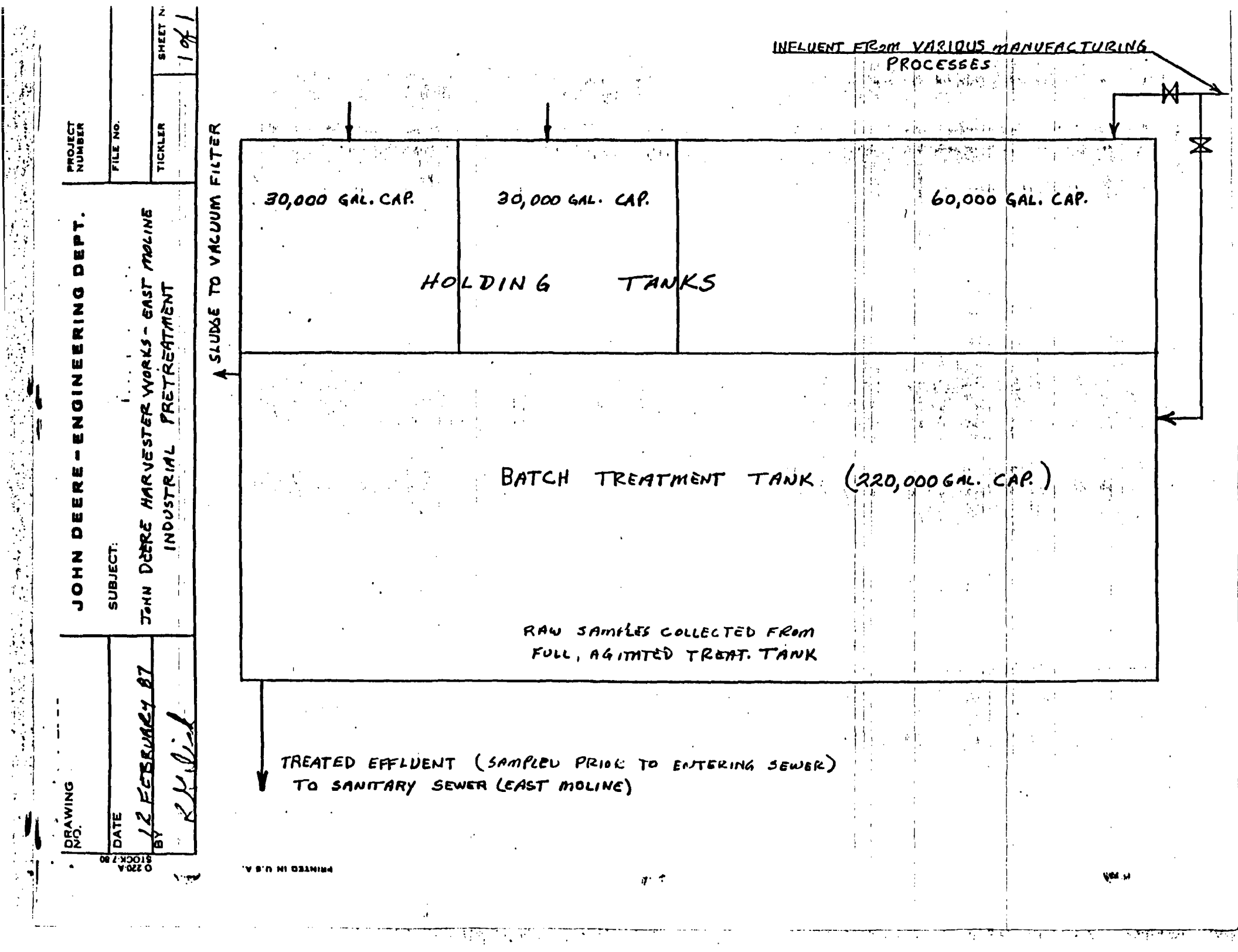
JOHN DEERE HARVESTER WORKS
EAST MOLINE, ILLINOIS
WATER FLOW SCHEMATIC

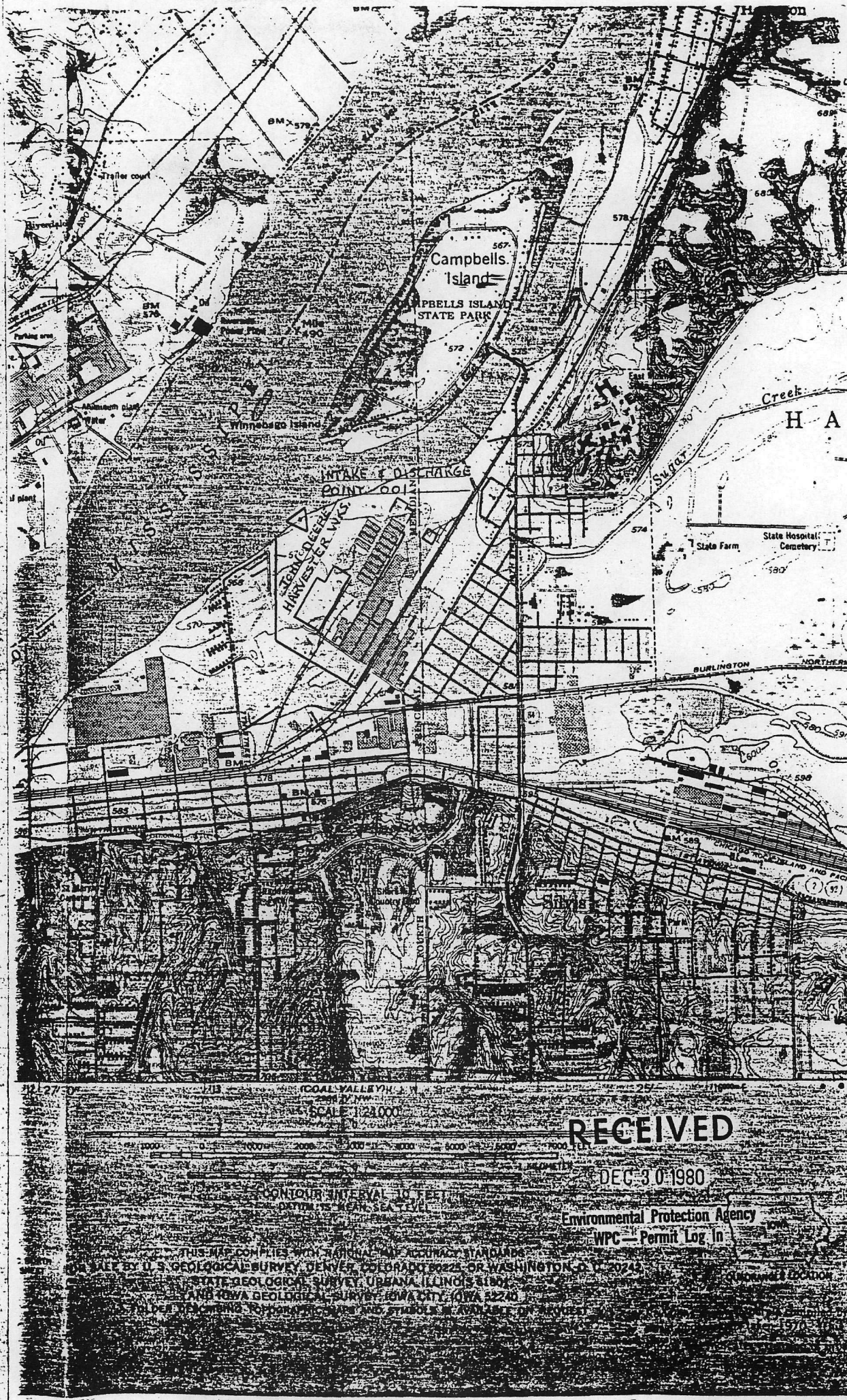
11 June 1986



J. DEERE HARVESTER SCHEMATIC

J. KAMMUELLER NO SCALE 9-18-89


INFLUENT FROM VARIOUS MANUFACTURING PROCESSES
30,000 GAL. CAP.
30,000 GAL. CAP.
60,000 GAL. CAP.
HOLDING TANKS
SLUDGE TO VACUUM FILTER
BATCH TREATMENT TANK (220,000 GAL. CAP.)
RAW SAMPLES COLLECTED FROM FULL, AGITATED TREAT. TANK
TREATED EFFLUENT (SAMPLED PRIOR TO ENTERING SEWER) TO SANITARY SEWER (EAST MOLINE)
JOHN DEERE - ENGINEERING DEPT.
SUBJECT: JOHN DEERE HARVESTER WORKS - EAST MOLINE INDUSTRIAL PRETREATMENT
PROJECT NUMBER
FILE NO.
TICKLER
SHEET NO. 1 of 1
DRAWING NO.
DATE 12 FEBRUARY 87
BY R.K. Bird
O 220-A STOCK 7 80
PRINTED IN U.S.A.


Campbells Island
CAMPBELLS ISLAND STATE PARK
Winnebago Island
INTAKE & DISCHARGE POINT 001
MISSISSIPPI R.
HARVESTER WKS
State Farm
State Hospital Cemetery
BURLINGTON
Sugar Creek
SCALE 1:24000
CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
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